Model XL-DC

High-Precision GPS Synchronized Time and Frequency Receiver

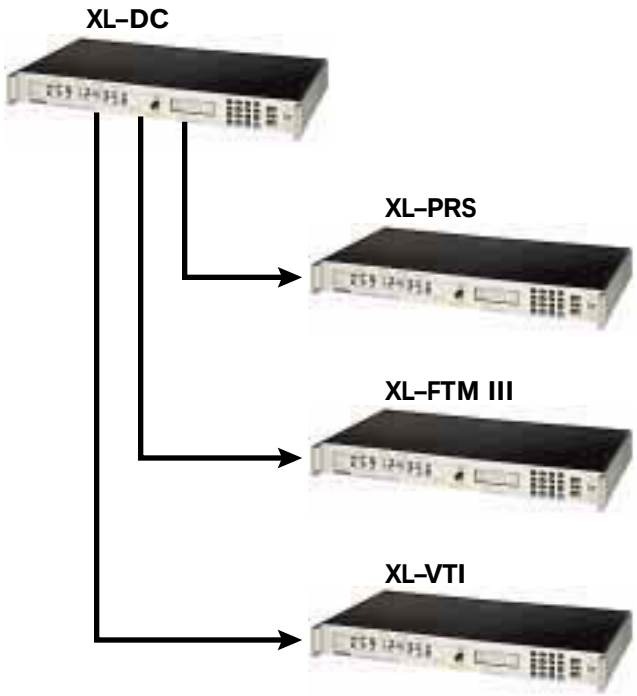
- **Less than 40 nanoseconds rms accuracy to UTC during Selective Availability (SA)***
- **Less than 1x10 $^{-12}$ frequency accuracy**
- **Versatile and modular architecture**
- **Supports many different output options**
- **Receiver Autonomous Integrity Monitoring (RAIM)**
- **1 PPS output**
- **IRIG B time code output**

The ultra-precise XL-DC provides the highest degree of time and frequency accuracy available in a GPS receiver. Outputs include a 1 PPS, analog IRIG B time code and serial I/O. Through a versatile and modular architecture, this precision timing accuracy is also made available to a wide range of application oriented time and frequency options.

The economical, rack-mounted XL-DC contains a modular backplane architecture capable of supporting multiple time or frequency output options. These plug-in output modules can be incorporated at any time and significantly increase the adaptability of the clock to changing application requirements.

True Time's proprietary multisatellite ensembling techniques and RAIM, coupled with the on-board GPS receiver, provide very stable and precise timing outputs. Timing accuracy is less than 40 nanoseconds rms to UTC even during Selective Availability (SA). This superior oscillator disciplining to GPS enables internal oscillator accuracy to less than 1x10 $^{-12}$.

The XL-DC is a proven reliable design and architecture – so much so that True Time builds many application-specific time and frequency products with an XL-DC core unit.



(Top photo shows Models 600, 601, and 602.)

Specifications XL-DC

Receiver/General

Timing Accuracy UTC/USNO: <40 ns rms (150 ns peak) with Selective Availability (SA) and tracking 6 satellites.*

Receiver Input: 1575 MHz L1 C/A code

Tracking: Six parallel channels. Multisatellite ensembling with system integrity monitoring.

Position Accuracy: Latitude, longitude, and altitude within 10 meters, referenced to WGS84, after completion of 24-hour initialization position averaging.

Acquisition Time: Warm start (has ephemeris data and position) typically <2 minutes. Cold start typically less than 20 minutes.

Internal Oscillator: 16.368 MHz VCTCXO

Accuracy: $<1x10^{-12}$ when tracking satellites
Stability: $1x10^{-9}$ at 1 second
$3x10^{-10}$ at 100 seconds
$1x10^{-12}$ at one day
Stability when Not Tracking Satellites: $2x10^{-6}$ over 0°C to +50°C

Timing Outputs

1 PPS Output: TTL into 50 ohms, rising edge on time. 20 microsecond pulse width. Rear panel BNC.

IRIG B Output: 1 kHz amplitude modulated carrier. 3 Vpp high, into 600 ohms. Rear panel BNC. DC level shift format optionally available.

Serial I/O: Bidirectional RS-232 port. Fixed protocol: 9600, 7, E, 1. DB9 connector. RS-422 optionally available.

Environmental

Operating Temperature:

Receiver: 0°C to +50°C
Antenna: -55°C to +85°C

Storage Temperature:

Receiver: -40°C to +85°C
Antenna: -55°C to +85°C

Humidity: To 95%, noncondensing

Antenna: 2.6" x 1.5", all weather, outdoor mounting. 50' of RG-59U supplied with system (cable runs >150' require optional downconverter).

Certification: UL, FCC, CE, C-UL
Contact True Time for specific options.

Mechanical

Power: 95–260 Vac, 47 to 440 Hz, <15 watts

Size:

Receiver: 1.75" x 17" x 10.38" (4.4 x 43.2 x 36.4 cm)
Antenna: 2.6" x 1.5" (6.6 x 3.8 cm)

XL-DC Configurations

The XL-DC is available in three configurations, enabling you to select the best XL-DC for your requirements.

Specifications XL-DC-600

This base model includes all standard features and a blank front panel with LED, GPS lock indicator, and power switch.

Specifications XL-DC-601

The XL-DC-601 includes all of the standard features of the Model XL-DC-600, plus the following:

Alphanumeric Front Panel Display: Initialization parameters, time of year, as well as alarm/status messages may be viewed on the 2-line, 32-character LCD.

Keypad: 0–9; up, down, left, and right arrows; CLR, FUNC/ENTR, TIME, STATUS, POSITION

Serial I/O: Full user-selectable RS-232 communication protocol up to 19200 baud.

Specifications XL-DC-602

This model includes all of the standard features of the Model XL-DC-601, plus the following:

Front Panel Time Display: LCD type, 10 digits, 1 line. Default is time-of-year.

Size: 6.9" x 0.85" (17.53 x 2.16 cm).

Options

- Network Time Server
- Oscillator Upgrades
- External Oscillator Control
- Antenna Downconverter
- Programmable Output Pulse Rates
- Frequency and Time Deviation Monitoring
- Time Code Outputs
- Precision Time and Time Interval Interface
- Telecommunications Interface
- Frequency Measurement
- Video Time Inserter
- Precision Frequency Outputs: 1, 5, 10 MHz
- PTTI
- Have Quick
- Time Interval/Event Timing
- Fiber Optic Antenna Link (up to 2 km)
- Differential GPS Mode (RTCM-104): 3 to 5 meter positioning
- Low Phase Noise Outputs
- Parallel BCD

* 100 ns peak without Selective Availability (SA) implemented.

Specifications subject to change without notice. 10/98